Order of Operations

BODMAS / PEMDAS

B - Brackets: Perform operations inside parentheses or brackets first.
O - Orders: Evaluate expressions with exponents (powers and roots).
D - Division: Perform division from left to right.
M - Multiplication: Perform multiplication from left to right.
A - Addition: Perform addition from left to right.
S - Subtraction: Perform subtraction from left to right.

SPECIAL PRODUCTS INVOLVING CUBES

The products are just the result of multiplying out the bracket.

(x + y)3 = x3 + 3x2y + 3xy2 + y3 (Cube of a sum)
(x − y)3 = x3 − 3x2y + 3xy2 − y3 (Cube of a difference)
(x + y)(x2 − xy + y2) = x3 + y3 (Sum of 2 cubes)
(x − y)(x2 + xy + y2) = x3 − y3 (Difference of 2 cubes

Law of Inclusion and Exclusion

PROBLEM SETS

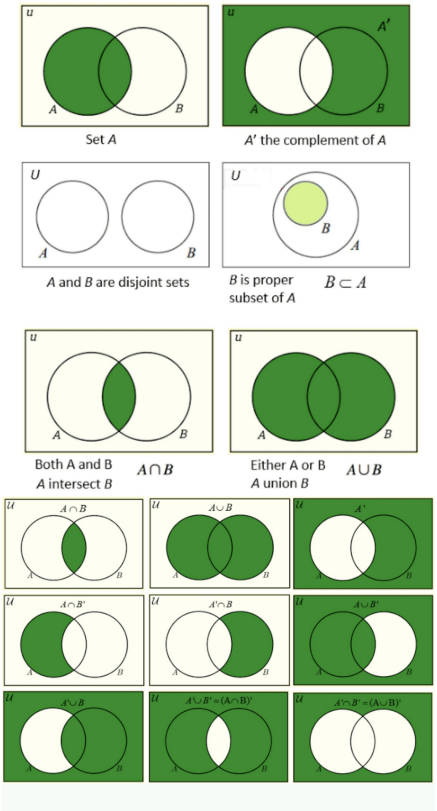
For three sets A, B, and C:
|A ∪ B ∪ C| = |A| + |B| + |C| - |A ∩ B| - |A ∩ C| - |B ∩ C| + |A ∩ B ∩ C|
and
|A ∩ B ∩ C| = |A ∩ B ∩ C| - |A| - |B| - |C| + |A ∩ B| + |A ∩ C| + |B ∩ C|

THE FOIL METHOD

FOIL – is sometimes used to find the product of two binomials.

We multiply,
• the First terms,
• the Outer terms,
• the Inner terms, and then
• the Last terms of each binomials.

Venn Diagram



RULES OF EXPONENT

Multiplication Rule	$a^x \times a^y = a^{x+y}$
Division Rule	$a^x \div a^y = a^{x-y}$
Power of a Power Rule	$(a^x)^y = a^{xy}$
Power of a Product Rule	$(ab)^x = a^x b^x$
Power of a Fraction Rule	$\left(\frac{a}{b}\right)^x = \frac{a^x}{b^x}$
Zero Exponent	$a^0 = 1$
Negative Exponent	$a^{-x} = \frac{1}{a^x}$
Fractional Exponent	$a^{\frac{x}{y}} = \sqrt[y]{a^x}$

Special Products

Product of a binomial and a trinomial of the form.

(a + b)(c + d + e) = ac + ad + ae + bc + bd + be

Monomial= 2y², 2
Binomial = (2y²-2)
Trinomial = (2y³+y²+2)

Special Products: Square of a Binomial

•Products in algebra have patterns that occur frequently
• These patterns are called special products
(x + y)² = x² + 2xy + y² (Square of a sum)
(x − y)² = x² − 2xy + y² (Square of a difference)

al Product

Product of Sum and Difference of Two Terms

(a + b)(a - b) = a2 - b2